

Ladders of Thirds and Tonal Jazz Melody

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Example 1 is from Miles Davis's 1956 recording of "Bye Bye Blackbird."¹ In both passages, over a II–V–I progression, Davis arpeggiates up from G and then down to F. Many melody notes lie beyond the triad, yet sound relatively stable, rather than ornamental. For instance, the F chord's seventh and ninth are departed by leap. And the cadential C7 chord finds no expression in Davis's melody. In the upper staff, m. 2, the A merely caps the arpeggio arising from G in the previous measure. In the lower staff in the same place, though the high F "resolves" by step to E, as is typical for Gm7–C7, the E's continuation into the next measure defines it as the major seventh of F: Davis presents Gm7–FM7 as two clean tetrachords, up then down—no C7. These two phenomena—stable, unresolved dissonances and apparent conflict between melody and harmony—are altogether typical of tonal jazz melody, and distinguish it from the common practice.² In this paper, I explain these phenomena using two theoretical tools: "ladders of

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- 1 All transcriptions are by the author and are notated at concert pitch. All of the recordings are fairly easy to locate on YouTube or other online resources. Chord symbols are simplified: "Bb"/"Bbm" indicates a triad plus some combination of major seventh, added sixth, and ninth (often functioning as local tonic); extensions beyond the seventh are not listed.
 - 2 The term "tonal jazz melody" deliberately dodges the question of composition versus improvisation (cf. Larson 2005). I assume that composed and improvised jazz of the 1920s through the 1950s, along with much of the "Great American Songbook," share many principles of melodic organization. "Tonal jazz" roughly covers the first half of the twentieth century, as distinct from later "postbop" practice. For more on the latter, see Strunk 2016 and Waters 2016.

thirds," structurally coherent stacks of thirds deriving from early African-American music; and Steve Larson's concept of "contextual stability" (1997, 107), by which dissonant notes can gain structural significance.

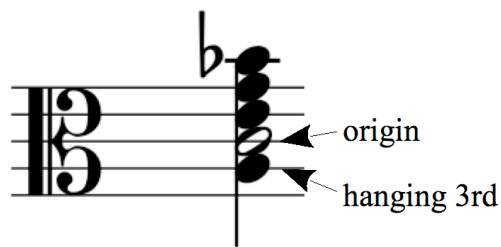
The image displays two staves of musical notation for Miles Davis's performance of "Bye Bye Blackbird" (1956). The top staff, labeled "Davis (trumpet) End of theme", shows the end of the theme with a time signature of [1:11]. It features a Gm7 chord, a C7 chord, and an F chord with a "break" bracket. The bottom staff, labeled "End of 1st chorus", shows the end of the first improvised chorus with a time signature of [2:12]. Both staves are in B-flat major and 4/4 time.

Example 1. From Miles Davis's performance of "Bye Bye Blackbird" (1956). The top staff shows the end of the theme; the bottom staff shows the end of Davis's first improvised chorus.

Previous theories emphasize tonal jazz's undeniable continuity with European tonality. These include Schenkerian theories (e.g., Larson 2009, Strunk 1985) and other approaches (Harrison 2016, Tymoczko 1997). Here, I argue that some of its features are better understood as developments of the African-American musical tradition. As a preliminary example, consider the gesture $\wedge 3-1$ to end a phrase (as seen below in Example 7, mm. 3, 5-6, and Example 9). Schenkerian theory would explain this as an elided $\wedge 3-2-1$, a gesture common in nineteenth-century music. But the $\wedge 3-1$ gesture might also be understood as motion within a quasi-modal "ladder of thirds" towards its central pitch (cf. Martin 1996, 48-59). This paper develops the conceptual aspects of this alternative view.

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Discussing early African-American music, Peter van der Merwe describes "long phrases built on the alternation of two notes a minor or neutral third apart," sometimes called a "pendular third" (van der Merwe 1989, 131; cf. Brandel 1962, 75–7). Motion from the upper to the lower note can serve to close a phrase in a manner analogous to $\wedge 2-1$ —hence the $\wedge 3-1$ closing gesture. Beyond the pendular third lies the "triadic mode"; a song in this mode is "built on the bare tonic triad, unadorned except perhaps for the occasional passing-note" (van der Merwe 1989, 134). Some songs extend this structure into a four- or five-note "ladder of thirds" like that shown in Example 2, which includes a triad, the "hanging third" below, and the seventh above (van der Merwe 1989, 118–30; cf. Brandel 1962, 86; Schuller 1968, 43–4).

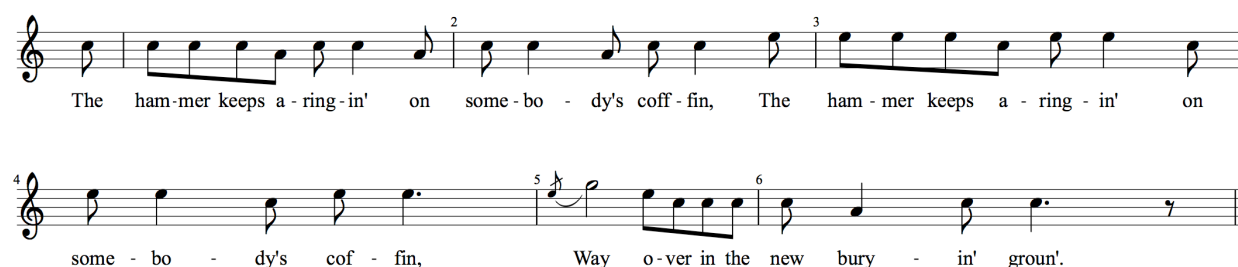


Example 2. A five-note mode in thirds centered on C: a "ladder of thirds."

Extracted from van der Merwe 1989, 118–30

Here, I apply the term "ladder of thirds" to any stack of thirds that organizes a melody: dyads, triads, and larger. As described by van der Merwe, a ladder of thirds operates in a manner analogous to a mode. The "origin" of the ladder (my term) serves as a melodic goal; distance from the origin creates melodic tension. A song built from a ladder can also include octave doublings and passing notes in between ladder-notes (van der Merwe 1989, 118–30). Example 3 shows one such song: starting and ending from the origin, C, the melody builds tension through a

gradual ascent up to the 5th before resolving via the hanging 3rd.³ (Going forward, ordinals written with numerals indicate positions on a ladder of thirds, as opposed to intervals in general.)



Example 3. A traditional African-American melody built from a "ladder of thirds."

Adapted from van der Merwe 1989: 124, Ex. 17

Ladders of thirds also organize many passages in the blues and tonal jazz. Example 4 shows a blues song organized around a triadic mode (three-note ladder) on C. (In the second phrase, the 5th is doubled in the lower octave.) The ladder persists through the accompaniment's chord changes to IV and V. The melody's four-measure phrases project a pattern of tension and resolution that works in rhetorical counterpoint with the accompaniment: two measures emphasizing the mode's 5th or 3rd, followed by the inflection of E-natural to E-flat and then a close on C.

3 The triad plus hanging 3rd make up four fifths of the major pentatonic collection; nevertheless, describing these melodies as pentatonic would have two misleading implications for melodic syntax: first, that \wedge^2 has equal status to the other notes—whereas \wedge^2 is often absent or serves only as a brief passing tone; second, that the normative position of \wedge^6 is a step above \wedge^5 —whereas its role as hanging 3rd (below \wedge^1) is no less salient.

Example 4. A blues song organized around a three-note ladder of thirds ("triadic mode").

Adapted from Stoia 2010, ex. 8

In the common practice, melody and accompaniment always project a unified contrapuntal framework, and as a result, notes of the melody that lie outside the locally governing harmony are always embellishments. For instance, in a piano piece, if the left hand presents G major harmony and the right hand plays a C, the C must be a passing tone, neighbor tone, or some other standard ornament. (Indeed, inculcation of this simple principle occupies a great deal of freshman theory.) These premises do not hold in Example 4 (nor in tonal jazz). Melody and accompaniment are not always united; for example, in m. 6, the C is literally a "non-harmonic tone," yet it anchors the melody's tonic ladder. Melody notes that lie outside the governing harmony do not always act as embellishments—see the same C. Yet the result is not a relativistic "melodic soup," where all tones carry equal weight: the distinction between embellishing tones and (foreground) structural tones still holds. For instance, the Fs in mm. 0, 1, and 2 all sound ornamental; the tones of the ladder sound structural. This poses a fundamental

problem: if the governing harmony no longer reliably serves to distinguish structural from embellishing melody tones, how are the structural tones to be discerned?

The answer is "contextual stability," a concept developed by Steve Larson.⁴ Structural tones are defined by contextual stability: they are approached or left by leap, or they begin or end a three-note passing-tone or neighbor-tone idiom. In Example 4, C, E, and G always behave this way. Conversely, embellishing tones are contextually unstable: they fall in the middle of three-note passing-tone or neighbor-tone idioms. In Example 4, D and F always behave this way. Other factors affecting contextual stability include metrical placement (*ceteris paribus*, stronger equals stabler) and a note's relationship to the accompaniment—though the lattermost is not definitive. Drawing on these factors, in all subsequent examples, contextually stable tones will be shown with normal noteheads, contextually unstable tones with small. Where it may otherwise be unclear, I mark passing tones and neighbor tones.

Therefore, an analysis of Example 4 based on the conventional distinction between chord tones and non-chord tones would miss the point entirely. The important thing is that the melody's contextually stable tones cohere into a ladder of thirds: C, E, and G, embellished occasionally by D and F. Melodic rhetoric arises from motion among the former. To describe this, we need new terms. C, E, and G are "ladder tones": contextually stable, structural tones; D and F are "non-ladder tones," contextually unstable embellishments. Of course, sometimes ladder tones are also chord tones (as in mm. 1–2)—but their contextual stability is primary, not their membership in a chord.

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4 Larson 1997, 107; compare the similar conceptualization in Givan 2010, 30–40; Martin 1996, 48–59; and Martin 2011, 7–9.

Passages built around the tonic ladder recur throughout tonal jazz. The opening of Bill Evans's 1961 solo on "My Romance," shown in Example 5, includes the ladder's 7th and the hanging 3rd. The solo opens with four expansive measures of the tonic triad (with the root doubled above) against four separate chords in the accompaniment. Motion up and down the ladder suggests a peak of tension in mm. 2–3 and a resolution to \wedge^1 in m. 5; but by m. 5, the accompaniment has already proceeded to a tonicization of A minor, undercutting the sense of resolution. In mm. 6–7, the 7th, B-flat, builds tension before the final cadential arrival, approached from below via the hanging 3rd.⁵ Also noteworthy is Evans's liberal use of chromatic non-ladder tones, in mm. 3, 4, and 7.

Example 5. Bill Evans, solo on "My Romance" (1961)

In Example 4, the downward inflection of the 3rd built melodic tension; in Example 5, the appearance of the flat 7th served a similar role at the end of the phrase. In Example 6, Benny Goodman develops this technique across a longer passage against a range of harmonies. Measures 1–6 revolve entirely around the D-flat triad and hanging 3rd, with several octave doublings; motion within this ladder and its interaction with the accompaniment give life to this

⁵ The "hanging 3rd" may appear a mere repackaging of the more familiar "added sixth." I employ the less-familiar term in order to emphasize the concepts' different implications: "added sixth" implies a note located a step above the fifth, sounding in a chord; "hanging 3rd" implies a note a third below the origin of a ladder of thirds, sounding in a melody.

passage. In mm. 6–8, a quick circle of fifths leads to the dominant. Then in m. 8, Goodman abruptly lowers the 3rd. The resulting melodic tension resolves in m. 9 with arrival on \wedge^1 , but by then, the accompaniment has already proceeded to IV (cf. Example 5, m. 5). The melody and accompaniment again fail to align in m. 10, when Goodman returns to the lowered 3rd over the accompaniment's I. In m. 12, Goodman teases at resolution with a brief F-natural, but abruptly returns to F-flat in m. 13. The passage closes with a long \wedge^5 , building anticipation for the solo's second half (not shown).

Example 6. Benny Goodman, solo on "King Porter Stomp" (1935)

Next, we examine two cadential passages in Louis Armstrong's work. First, in Example 7, mm. 1–3, the ladder tones cohere into a tonic ladder with hanging third. Armstrong sustains this ladder against a wide range of harmonies in the accompaniment. He circles around A-flat, playing on the tensions built into the tonic ladder, and ultimately synchronizes his arrival on \wedge^1 with the accompaniment's V–I (mm. 3–4). In m. 4, the ascent to F briefly tracks the accompaniment's motion to V/II. Then mm. 5–6 reprise m. 3.

Example 7. Louis Armstrong, solo on "Heebie Jeebies," ending (1926)

In mm. 1–3, many of the ladder tones fit the accompanying chords; for instance, in m. 15, F and A-flat are fifth and seventh of the accompanying B♭7. But while this description is true in a literal sense, it obscures other aspects of the melody's organization: the phrase's tension comes from Armstrong's orbit around and ultimate arrival on A-flat. Along the way, occasional alignments with the accompaniment appear incidental. To support this claim, Example 8 reharmonizes mm. 1–3 with more clashes between melody and harmony. The result remains plausible within the style; the melody and harmony's separate, complementary syntaxes remain essentially the same as the original.

Example 8. Reharmonization of Example 7, mm. 1–3

Example 9 shows essentially the same close in another Armstrong interpretation. After two drawn-out measures of tonic, with B4 serving as a large-scale passing tone from C5, Armstrong arrives on $\wedge 6$, the hanging 3rd, in m. 3. From here, he scoots up the ladder to E, the

3rd, and then returns to $\wedge 1$ for the cadence. The accompaniment's dominant has no expression in his melody.

Example 9. Louis Armstrong, "La Vie En Rose," ending (1950)

Finally, we consider the closing phrase of Frank Loesser's 1950 composition "If I Were a Bell," from *Guys and Dolls*, shown in Example 10. Beginning from the major 7th (as opposed to the blue-tinged lowered 7th), the melody descends through a ladder, skips past the origin to the hanging 3rd below, and then circles back at the cadence—an inversion of Armstrong's close in Examples 7 and 9.⁶ This close is unintelligible in conventional terms, but the tonic ladder organizes it perfectly.

Example 10. Frank Loesser, "If I Were a Bell," mm. 28–31

6 Other popular songs built around a ladder of thirds include George Gershwin's "They Can't Take That Away From Me" (1937) (the eight-measure A section is based entirely on a tonic triad with hanging third) and Burton Lane's "Old Devil Moon" (1947) (the dramatized ascent and descent through a tonic triad, against a variety of chords).

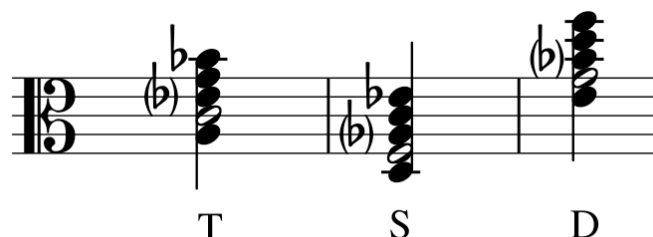
Melodic syntax in these passages depends on motion within a ladder of thirds and judicious use of the lowered 3rd and 7th. To a large extent, this syntax floats free of the accompanying harmony: these melodies could work against a range of chord progressions. This is not to say that such passages are "bitonal" (contra Schuller 1968, 48). As van der Merwe cautions, "We must be careful to distinguish [the] *melodic* triad from the familiar harmonic variety" (van der Merwe 1989, 125). Instead, the melody is oriented around its own pitch field, such that melody and accompaniment no longer form a contrapuntally coherent whole; the tensions built into the ladder of thirds act in parallel with those built into the accompanying chords. A useful term for such passages is "stratified tonality," because melody and harmony operate in two separate layers. (Temperley 2007).⁷

According to a conventional reading, in such passages, "The improvised melody is dissonant with some of the surface level chords because it articulates a deeper harmonic level consisting of only the tonic chord" (Givan 2010, 46). Commenting in a similar vein, Scott DeVeaux notes that such passages can "cool[] . . . the harmonic temperature to a state approaching absolute repose" (1997, 112). At one level, this is perfectly accurate: these melodies are indeed based on the overall tonic, moving exclusively within the tonic ladder of thirds while the accompaniment moves through distinct harmonies. But this view threatens to imply that these melodies are static, akin to a kind of tonic drone. Though these melodies lack "voice-leading through descending linear progressions" (Martin 2011, 7), they are not static; their energy comes from motion within a ladder, a perfect complement to the accompaniment's tonal progression.

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⁷ Temperley applies this term to some passages in rock music; stratification's equally prominent role in jazz reflects these styles' shared debt to early African-American music.

Ladders of thirds can originate from $\wedge 4$ and $\wedge 5$ as well as $\wedge 1$ (Stoia 2010). Example 11 shows these three ladders, labeled by Riemannian function; they appear in the blues melody shown in Example 12. In Example 12, the melody and accompaniment are not stratified, but rather unified by a common framework, as in the common practice.⁸ And since the chords, and ladders, change frequently, the analogy between ladders and modes no longer applies. Rather, the ladders operate locally, as pitch fields or frames into which the melody fits at various times. Though melody and accompaniment are unified in this example, the subdominant and dominant ladders can also play a role stratified tonality, as we will see momentarily.



Example 11. The five-note ladder of thirds transposed to the three primary triads, Tonic, Subdominant, and Dominant. Adapted from Stoia 2010, exx. 1, 4, and 5

Example 12. A blues song featuring ladders on Tonic, Subdominant, and Dominant. Adapted from Stoia 2010, ex. 6

⁸ In this case, it may seem gratuitous to invoke ladders of thirds at all, provided we accommodate the "added sixths" in mm. 4 and 6, but referring to them here will help make sense of later examples.

In Examples 4–6, the tonic ladder's lowered 3rd and 7th created tension and variety. Sidney Bechet's 1951 solo on "Kansas City Man Blues" (Example 13) further develops this technique. Bechet first recorded this song in 1923; this later version also represents Bechet's traditional New Orleans style. Example 13 aligns the two choruses vertically. In both choruses, mm. 1–3 juxtapose the tonic ladder's inflected and diatonic tones within a precipitous melodic contour: note the use of D-flat and, in the second chorus, G-flat. (An italic "T" indicates the inflected tonic ladder.) Bechet also employs the inflected tonic ladder in m. 6, superimposed against the accompaniment's IV; the G-natural in m. 7 resolves the tension. (A horizontal bar indicates stratified tonality, with the ladder shown above, the accompanying harmony below.) In m. 8, Bechet reaches the ladder's diatonic major 7th: Bechet's rapid arpeggio defines the D as an unambiguous ladder tone. Finally, in mm. 10–11, the chorus's close is marked by motion within the tonic ladder, rather than conventional stepwise motion.

Example 13 also introduces a new form of stratified tonality: in mm. 9–10, Bechet superimposes a subdominant ladder over the accompanying dominant chord. The clear thirdwise organization and contextual stability of E-flat and A-flat define the ladder: E-flat precludes the dominant ladder; A-flat precludes the tonic. Ordinarily, subdominant is preparatory of, and subsidiary to, cadential dominant. As a result, this form of stratified tonality, subdominant against dominant, undercuts the argument that such a melody "articulates a deeper harmonic level" than the accompaniment. Instead, the melody's ladders underlie its rhetoric, not the tonal background: a repeated plunge through the subdominant, starting from high E-flat or G, pivoting into the tonic midway through m. 10. The melody's S–T plays against the accompaniment's D–T.

Example 13. Sidney Bechet, solo on "Kansas City Man Blues" (1951)

Our discussion of stratified tonality concludes with Lester Young's 1936 solo on "Shoe Shine Boy." Example 14 shows the first sixteen measures, with the eight-measure sections aligned vertically. Though this passage features six V–I progressions (mm. 2–3, 4–5, and 7–8), Young never articulates the cadential dominant. Instead, he always superimposes tonic or subdominant. (The only possible exception is in m. 7, upper staff, where the low C might suggest a brief dominant.) Seen here for the first time is the inflection of the subdominant ladder, by the D-flat at the opening and close of the passage. While natural $\wedge 6$ can sound tonic or subdominant, lowered $\wedge 6$ can only sound subdominant (or sometimes dominant, as described below). As a result, the dyad F–D-flat is unambiguously subdominant: the D-flat precludes tonic; the

sustained F clashes with the E in the accompaniment's dominant, precluding dominant. The melodic motion from D-natural to D-flat to C operates in tandem with the accompaniment's Gm7–C7–F progression, projecting a complementary pattern of tension and resolution.

Example 14. Lester Young, solo on "Shoe Shine Boy" (1936)

To indicate the salience of the line from D to C, I mark it with a dashed line: as shown here and in later examples, successive ladders of thirds sometimes generate "voice-leading through descending linear progressions," though the linear progressions often lie outside common-practice norms. Following the approach in Love 2012 (§4.1–4.7), I invoke these paths without their Schenkerian connotations. Like a Schenkerian middleground, these paths perceptually anchor the melody; unlike a Schenkerian middleground, they are not beholden to the rules of counterpoint, nor must they fit the harmony, nor must they always proceed downwards, nor do they include implied tones.

Compared to the previous examples, the stratifications in this allegro passage are quite brief. (The slow tempo of Example 13 elongates its notationally short stratifications.) They occur in between long segments where the melody tracks the accompaniment: m. 3 through the first half of m. 4, and mm. 5–6.⁹ Nevertheless, stratification still usefully accounts for the moments

⁹ Even when the ladders fit the accompaniment, a certain looseness characterizes the temporal

that challenge conventional tonality. For instance, in m. 4, Young's jarring arpeggiation of F against the accompaniment's C7 is not bitonal, nor simply the bluff assertion of the tonic F harmony; rather, Young's motion up then down the tonic ladder presents a parallel syntax to the accompaniment's V–I. It compresses the gesture of Example 4, mm. 5–8, or Example 7, mm. 2–3. Likewise, in mm. 2 and 15, Young's sustained F and D(-flat) might conventionally be labeled "C9sus," a label that is literally accurate but explanatorily empty—or even downright misleading, considering the absence of C and G (crucial elements of "C") from these moments. The subdominant ladder enters coordinated with the accompaniment's motion to Gm7; Young simply intensifies this ladder with D-flat.

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It is time for some conceptual housekeeping. Example 15 modifies Example 7. First, based on the above examples, it is useful to dissociate the tonic ladder into two ladders: diatonic, including the major 3rd and 7th; and inflected, including the lowered 3rd and 7th. This dissociation reflects

relationship between melody and accompaniment. I refer here not to "microrhythmic"

temporal inflections (as in Benadon 2006, 2009, or Butterfield 2010, 2011), but rather to

"macrorhythmic" shifts of an eighth note or more. Consider Example 7, mm. 15–16:

Armstrong arrives on A-flat just before the accompaniment reaches I. Such misalignments

were ubiquitous from jazz's earliest days. Larger shifts also arise. In Example 14, m. 6, third

staff, the accompaniment shifts to D7 on the downbeat, but Young does not articulate this

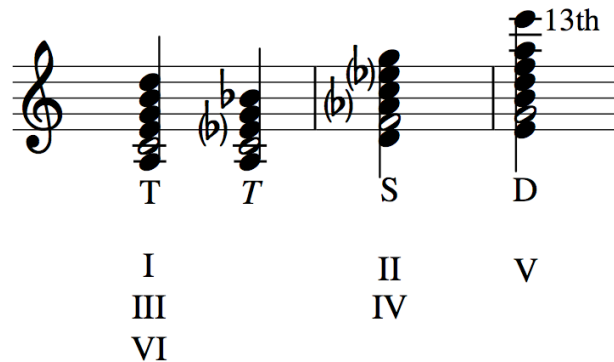
harmony until the second beat. These shifts suggest that soloists conceptualize the

accompaniment's harmonies as pliable, able to bend without breaking. For present purposes, if

a ladder arrives within a beat of the related chord, it remains fair to say that the ladder "fits"

the accompaniment.

the tension-building function of the lowered tones versus the resolving function of their diatonic counterparts. Example 15 also extends the ladders to include their furthest reaches: the 9th and, for the dominant, the 13th. These tones will be illustrated in later examples.



Example 15. The Tonic, Subdominant, and Dominant ladders of thirds

So far, our discussion has focused on passages of stratified tonality, because ladders of thirds' independence stands out most clearly there. But usually, tonal jazz melody follows the harmonic framework of the accompaniment, as in common practice music. Let us say in such cases that the melody "assimilates" the accompaniment. When the melody assimilates the accompaniment, contextually stable tones sound as both ladder tones *and* chord tones—"ladders" and "chords" are practical equivalents—with one crucial proviso: "chord tone" must accommodate not only the triad but also the ladder's 7th, 9th, and so on—"extensions."

On an orthodox Schenkerian view, extensions always require stepwise resolution.¹⁰ Viewed more liberally, extensions are understood to add "color" to conventional functional harmony, through their invocation of upper harmonic partials or their fitting some subsidiary

¹⁰ On these tones' obligation to resolve by step to stabler tones, see Strunk 1985, 98, and Larson 1998, 212–218. For a more liberal adaptation of Schenkerian theory, see Martin 1996, 14–15, or Givan 2010, 30–40. For an opposing view, see Arthurs 2011, 44–53.

harmonic syntax (e.g., Harrison 2016, 25, 113–14; McGowan 2010, 2011). However, these latter explanations focus on "the vertical dimension," insufficiently distinguishing extensions' harmonic and melodic uses (McGowan 2011, 157). Ladders of thirds offer a new perspective on extensions' melodic syntax: a description of their typical use grounded in theoretical principles.

Example 15 defines the conditions in which a contextually stable tone assimilates the accompanying harmony versus separates from it (as in stratified tonality).¹¹ I assume a priori that a contextually stable tone projects one of three functions (or it is functionally vague): Tonic, Subdominant, or Dominant.¹² (These functions are highly localized; in jazz, the implied key can fluctuate rapidly.) The function projected by a contextually stable tone depends on two factors:

¹¹ I emphasize that any note may function as a *non*-ladder tone, provided it resolves

idiomatically (it is contextually unstable). Example 15 only illustrates notes' capacity to function as ladder tones, projecting harmonic function.

¹² James McGowan has applied Riemann's three-function theory to jazz (2010 and 2011). The diatonic ladders comprehend the sets of triads that Riemann understood as functionally related: the tonic ladder combines VI, I, and III; the subdominant, II, IV, and VI; the dominant, III, V, and VII. Similarly, Steven Strunk has proposed five "substitution sets" of mutually interchangeable chords in bebop (Strunk 1985, 100). His "I set," "IV set," and "V set" partially overlap with my T, S, and D ladders. While "subdominant" implies a IV chord, in jazz, II is a much more common pre-dominant. The discrepancy between the label "S" and the preference for pre-dominant II makes more sense when we recall that a ladder of thirds is not a harmony, but rather a frame for organizing a melody. The ladder's label "S" reflects this difference.

the presence of other contextually stable tones that imply a shared ladder of thirds (typically because they are a third, fifth, or seventh away); and the accompanying harmony.

With respect to the first factor, contextually stable tones are sometimes functionally definitive on their own. Each diatonic ladder of Example 15 omits one note of the scale. These omissions reflect limits on tones' ability to express tonic, subdominant, or dominant: alone, $\wedge 4$ can never express tonic, $\wedge 7$ can never express subdominant, and $\wedge 1$ can never express dominant.¹³ It is for this reason, for instance, that the ladder in Example 13, mm. 9–10, must be subdominant: this is the only possibility, given the presence of both E-flat ($\wedge 1$) and A-flat ($\wedge 4$). The result is unequivocal stratification: the melody overcomes the accompaniment and projects an independent structure.

On the other hand, many tones are ambiguous with respect to function. Back in Example 12, if C-major accompaniment had persisted into m. 3, then C and A would likely have sounded like the origin and hanging 3rd of the ongoing tonic ladder; but given the chord change, they act as 5th and 3rd of a subdominant ladder. (In the same way, in the common practice, a melodic $\wedge 5$ is a dominant chord tone if the accompaniment presents V, but a tonic chord tone if the accompaniment presents I.) As shown in Example 15, every scale degree appears in more than one diatonic ladder, and $\wedge 2$, $\wedge 3$, $\wedge 5$, and $\wedge 6$ appear in all three. Even most dyads are ambiguous; in the right context, $\wedge 2$ and $\wedge 7$ can project tonic (see Examples 17–18). Such ambiguities are

¹³ In jazz pedagogy, these are sometimes called "avoid notes," as in the injunction, "During a V chord, avoid $\wedge 1$." More accurately, an "avoid note" employed as a ladder tone will usually result in stratified tonality; it will fail to do so only in the presence of tones strongly indicative of the otherwise-precluded function. For instance, if a melody included a contextually stable $\wedge 1$, but also loud or repeated $\wedge 5$ and $\wedge 2$, it could assimilate dominant function.

usually resolved by the accompaniment: the Roman numerals in Example 15 indicate the accompanying chords that typically suggest each function. For instance, over II (or IV), the melody's contextually stable $\hat{6}$ and $\hat{1}$ will sound subdominant; over I, they will sound tonic. At a further extreme, a sustained $\hat{2}$ in the melody, surrounded by rests, will project tonic if it sounds against I (or III or VI), subdominant if it sounds against II (or IV), and dominant if it sounds against V.

This argument assumes that the accompanying harmony is functionally clear, which is typical in tonal jazz (Martin 1988). Indeed, such functional clarity may be a prerequisite for acoustically dissonant tones to assimilate their accompaniment. Compare Daniel Harrison's discussion of a phrase-ending tonic major seventh: in the phrase in question, the final tonic harmony is "overdetermined," being "strongly predicated" by the phrase's simple T–D / D–T harmonic organization; and so "the wild major-seventh chord sounds perfectly appropriate as the phrase-concluding chord" (2016, 97). The functional clarity of the accompaniment enables the "wild" extra-triadic close. Harmonic function is similarly overdetermined in tonal jazz, not only by the recurrence of stereotyped chord progressions (e.g., II–V–I) and thematic structures (ABAC, Rhythm changes, etc.), but also by the cyclic structure of the typical performance, involving many cycles of the same theme played end to end (Love 2013, 49–50).

These forces are so powerful that even an unaccompanied single-line solo on a familiar theme can employ the full range of extended ladder tones without loss of functional meaning. Example 16 shows two cadential passages from an unaccompanied trumpet solo by Roy Hargrove. Considered in isolation from the implied accompaniment, the melody seems to present subdominant moving to dominant (as labeled below the staves). Aside from the contextually

stable tones themselves, the melodic paths from G to F or E-flat to D naturally articulate this motion. But to a listener familiar with the tune, who "hears" the implied accompaniment (and, presumably, to Hargrove himself), the melody projects subdominant over the accompaniment's dominant (stratified tonality), and then assimilation of the cadential tonic by the 9th or 7th (as labeled between the staves).

The image displays musical notation for Example 16, Roy Hargrove's unaccompanied solo on "Dewey Square" (1995). It consists of two staves. The top staff, labeled "Hargrove (trumpet)", shows a melody in 4/4 time with a key signature of two flats. Above the staff are time markers [0:46] and [1:39], and chord symbols [Fm7], [Bb7], [Eb], [Bb7], and [Eb]. The melody includes notes marked with "N" (normal), "P" (pedal), and "3" (triplets). The bottom staff, labeled "Ladders", shows two sets of ladder tones. The first set, labeled "With implied accompaniment:", shows a subdominant (S) and a tonic (T) ladder. The second set, labeled "In isolation:", shows a subdominant (S?) and a tonic (D?) ladder. The ladders are represented by vertical lines with dots at the top and bottom, connected by a horizontal line.

Example 16. Roy Hargrove, *unaccompanied solo on "Dewey Square"* (1995)

Although "ladder tones" are often equivalent to "chord tones," Example 16 also illustrates why it is best to consistently use the term "ladder tone" for a melody's structural (contextually stable) tones. In the second measure of each cadence, the tonic ladder tones are also, with respect to the accompaniment, chord tones. But in the first measure of each cadence, the subdominant ladder tones are not chord tones, or are only incidentally so—and to call the incidental intersections "chord tones" of Bb7 risks obscuring the subdominant ladder, which organizes the melody far more plainly than does the accompanying harmony. (For instance, we should not describe the A-flat as the seventh of Bb7.) Rather than talk about ladder tones in one measure and chord tones in the next, it is far simpler to refer consistently to "ladder tones," and then distinguish cases where the melody assimilates versus separates from the accompaniment.

* * *

To assimilate the accompaniment, a ladder's extensions need to be highly stable, or else they will sound like embellishments. Return to Example 13, m. 5, upper staff. Theoretically, the G and B-flat are the 7th and 9th of a subdominant ladder; but syntactically, because they immediately resolve to A-flat, they sound too unstable to be ladder tones: they are seventh and ninth only in a literal, intervallic sense, not in a structural sense. In contrast, consider the D in m. 8 (either staff). Bechet approaches it thirdwise from the E-flat below; sounding against the accompaniment's E-flat chord, this unequivocally defines it as the (structural) 7th of a tonic ladder. Another way to put this is that a first-level reduction of this melody, removing obvious embellishments, would preserve this D. (Though the D ultimately proceeds by step across the next barline, by this point, the chord has changed: the D persists through the end of the tonic harmony.)

Examples 17 and 18 further illustrate the tonic ladder's 7th and 9th. In Example 17 the would-be hanging 3rd (B-flat) instead acts as a lower neighbor to the 7th. In the last measure of Example 18, the tonic root (C) acts as a passing tone between the 7th and 9th. Thus, just as extensions need to be contextually clear, lest they sound ornamental, the inverse is also true: in the right context, normally stable tones will sound contextually unstable and serve an ornamental role. Example 18 also showcases the stepwise voice leading common in bebop melody. Across the first two measures, each step in the descent from F to C is embellished by a ladder. To embellish D, Parker leaps to the third below, creating a non-functional "passing ladder"—a device which synthesizes European tonality's stepwise voice leading with African-American ladders of thirds. Passing ladders appear in several later examples as well.

The musical score for Example 18 is presented in three staves. The top staff is for Garner (pno), the middle for Parker (alto sax), and the bottom for Ladders. The key signature is B-flat major (three flats). The time signature is 4/4. The score is divided into measures by bar lines. Above the Parker staff, the chords are labeled: D6, Bbm7 C7, Ebm7b5 F7, Ab7, D6, Bbm7 F7, Ebm7b5, Ab7, and C. The Parker staff shows a melody with various ornaments: P (passing), N (neighbor), and N3 (triple neighbor). The Ladders staff shows the harmonic structure with D/IV, S, S, and T. The time signature for the Ladders staff is 4/4.

Example 18. The tonic seventh and ninth in a Charlie Parker solo on "Cheryl" (1947)

The tonic ladder also comes in a minor variant, with lowered 3rd. This ladder can include its hanging 3rd below. In Example 19, Bechet leaps to and from the hanging third. The major 7th, $\wedge 7$, assimilates minor tonic function relatively rarely. This may result from the additional markedness of the leading tone in minor. On the other hand, the 9th, $\wedge 2$, more readily assimilates minor tonic function, especially when paired with the hanging 3rd. Example 20 illustrates. This pairing displays a remarkable logic. Consider the alternatives: if $\wedge 2$ proceeds to $\wedge 3$ or $\wedge 1$, it will sound like a non-ladder tone that resolves by step; if $\wedge 2$ leaps to $\wedge 4$, $\wedge 5$, or $\wedge 7$, the pair will imply an interpolated dominant. Only the decisively tonic $\wedge 6$ can encourage $\wedge 2$ to express tonic as well. (Alternatively, $\wedge 2$ might be contextually stabilized ending a phrase, e.g., $\wedge 3-2$.)

Example 19. The minor tonic's hanging third in a Sidney Bechet solo on "Summertime" (1939)

Example 20. The minor tonic ninth paired with $\wedge 6$ in a Bud Powell solo on "Tempus Fugit"

(1949)

Turning to the subdominant ladder, in Example 13, m. 9, the lower staff included \wedge^3 (G) as a ladder tone: the subdominant 7th. The G sounded atop a stack of thirds extending up from F in the previous measure, clearly defining its place on the ladder. A third higher, \wedge^5 can also serve as a subdominant ladder tone (11th of II or 9th of IV), but it is sometimes compromised by ambiguity with the tonic ladder. In Example 21, m. 1, all four melody notes (\wedge^6 –1–3–5) are shared with the tonic ladder, and Young highlights this ambiguity by sustaining these notes across the dominant and through the tonic in m. 4. This ambiguity is built into the system of diatonic extensions. The tonic ladder's upper reaches blur into dominant; the dominant's blur into subdominant; and the subdominant's blur into tonic. (Refer back to Example 15). In mm. 5–7, on the other hand, stepwise voice leading between chords establishes the ladders' functions more clearly.

The image shows a musical score for Example 21. The top staff is for Young (tenor sax) in B-flat major, 6/8 time, measures 1-7. The bottom staff is for Ladders, showing chord functions: S? (Bbm7), T? (Eb7), T (Ab), T (Ab), S (Bbm7), D (Eb7), and T (Ab). The Young staff has notes: m1: Bb, D, F, Ab; m2: Eb, G, Bb, D; m3: F, Ab, Bb, D; m4: Ab, Bb, D, F; m5: Bb, D, F, Ab; m6: Eb, G, Bb, D; m7: F, Ab, Bb, D. The Ladders staff has chords: m1: Bbm7, m2: Eb7, m3: Ab, m4: Ab, m5: Bbm7, m6: Eb7, m7: Ab.

Example 21. A would-be 11th of II compromised by ambiguity with the tonic ladder in a Lester

Young solo on "Tea for Two" (1952)

\wedge^5 assimilates subdominant more readily when \wedge^4 or lowered \wedge^6 appear as ladder tones below it, since these do not belong in the tonic ladder. In Example 16 above, \wedge^4 grounded the first subdominant ladder and supported \wedge^5 as uppermost ladder tone. In Example 22 here, in m. 1, the tetrachord D–F–A–C (\wedge^6 –1–3–5) assimilates the accompaniment's tonic. In m. 2, when Young lowers the D to D-flat, subdominant function is now the only possibility: lowered \wedge^6 could not belong to a tonic ladder; and while lowered \wedge^6 , in isolation, could assimilate the

accompaniment's dominant (as flat 9th), the contextual stability of F, A, and C throughout this passage makes these tones continue implicitly over the D-flat, negating the dominant ladder.

(Compare the opening and close of Example 14, earlier in the same solo.)

Example 22 shows a musical passage for Young (tenor sax) and a corresponding Ladders diagram. The Young staff is in F major, starting at [1:15]. The Ladders diagram shows a four-note ladder (G, A, B, C) with a lowered 6th (B-flat) resolving the ambiguity between tonic and subdominant. The Young staff includes chords F, Gm7, and C7, and the Ladders diagram includes chords T, S, or T II, and S/V.

Example 22. Lowered $\wedge 6$ resolves the ambiguity between tonic and subdominant in a Lester

Young solo on "Shoe Shine Boy" (1936)

The dominant 9th appeared in Example 13, m. 4, upper staff (in an applied dominant of IV). Notice its stereotypically stable position atop a four-note ladder extending from G. The dominant 13th lies a fifth above the 9th. Example 23 illustrates this positioning, which defines the 13th's place on the ladder as distinct from the homographic hanging 3rd. Example 24 shows two similar 13th-9th pairings in a passage by Charlie Parker; Parker also includes the seventh below the ninth. Finally, note the stepwise voice leading from the 13ths, the second of which initiates a descending fifth-progression in the final two measures.¹⁴

Example 23 shows two solo choruses for Young (tenor sax) and corresponding Ladders diagrams. The first solo chorus is marked [0:52] and the second is marked [1:25]. The Young staff includes chords D7, Dm7, and G7, and the Ladders diagram includes chords D/V, S, and D. The Young staff includes notes N, N 14, 15, and 16, and the Ladders diagram includes notes 13th and 9th. The Young staff includes a triplet of notes, and the Ladders diagram includes a triplet of notes.

Example 23. The dominant ninth and thirteenth in a Lester Young solo on "All of Me" (1956)

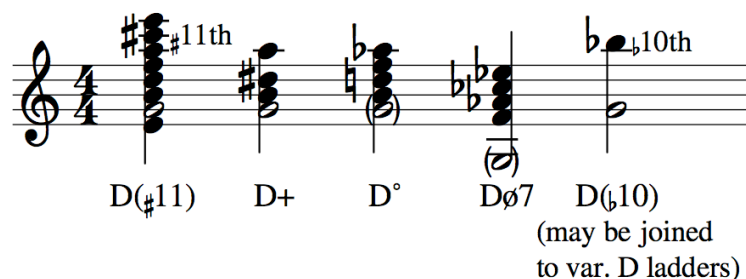
The image displays a musical score for Example 23. The top staff, labeled 'Parker (alto sax)', shows a melodic line in 4/4 time with a key signature of one flat. Above the staff are chord symbols: A7, D7, G7, Gm7, and C7. The notation includes various ornaments: 'N' for natural, 'P' for phrasing, and '3' for triplets. A time signature of [0:20] is at the beginning. The bottom staff, labeled 'Ladders', shows the harmonic structure with notes grouped into ladders. The ladders are labeled D/VI, D/II, D/V, S, and D. The notes are marked with '9th' and '13th' to indicate the dominant ninth and thirteenth extensions. Curved lines connect the notes across the staves, showing the relationship between the melody and the harmonic support.

Example 24. Dominant ninths and thirteenths in Charlie Parker's improvised bridge on "Chasin' the Bird" (1947)

Contextual stability and clear positioning within their ladders allows these extensions to carry their melodies' structure in spite of their dissonance. Extensions do not "need" to resolve any more than any other tones, nor do they merely add color; rather, their use follows from ladders of thirds' original, quasi-modal use: they rest on the structural coherence of stacks of thirds, which holds fast even in the face of dissonance with the accompaniment.

* * *

Mid-century tonal jazz is characterized by extraordinary chromaticism, often organized around ladders of thirds. Example 25 shows the main chromatic ladders that had emerged by the 1950s. The dominant's natural 11th, $\wedge 1$, would undercut the leading tone and thus dominant function, and so the dominant ladder originally had a gap between the 9th and 13th. This gap was filled by the sharp 11th, of which the whole-step distance from the leading tone preserved functional clarity. Example 26 illustrates the sharp 11th in a passage by Charlie Parker, during the F7 chord (V/V). Parker approaches the 11th from the 13th above, via chromatic passing tones, and then leaps away. The sharp 11th most often appears during applied dominant chords, as here. Once again, this passage also showcases Parker's masterful voice leading between successive ladders. Every ladder tone is clearly defined and contextually stable.



Example 25. Common chromatic dominant ladders

Example 26. The dominant sharp 11th in Charlie Parker's improvised bridge on "Dewey Square" (1947)

Two other dominant-function ladders had emerged by the 1930s: the augmented and the diminished, built from the cycle of major and minor thirds, respectively. Example 27 shows the augmented ladder in a passage that highlights its cyclical structure. The ladder's sharp fifth is under no obligation to resolve up by half-step. It just as often resolves down, as here. As shown in Example 25, the ninth sometimes appears above the augmented fifth. The augmented fifth and ninth form the interval of a diminished fifth, which pulls toward \wedge^3 and \wedge^5 . Example 28 shows this pairing in a Bix Beiderbecke solo. In the top staff, m. 2, the dominant's raised fifth first appears as a chromatic lower neighbor before Beiderbecke leaps away from it, stabilizing it. The ninth, C, appears a fifth above it, in the correct register. In a later passage, shown in the third

staff, Beiderbecke leaps directly to the F-sharp and then the C in close succession, highlighting their contextual stability and their tendency to resolve inward together.¹⁵

Example 27. The augmented ladder in a Lester Young solo on "Lester Leaps In" (1939)

Example 28. The augmented ladder including the ninth in a Bix Beiderbecke solo on "Singin' the Blues" (1927)

The diminished ladder is equivalent to a viio7 chord superimposed over V, and gives rise to the dominant flat 9th. As illustrated in Example 29, where Coleman Hawkins leaps among the ladder tones, the origin (^5) is typically omitted from this ladder. Omitting the origin emphasizes the cycle of minor thirds. Above, Example 26 (m. 1) also included the diminished ladder, on C7.

¹⁵ This pairing appears in the Jerry Livingston's composition "Under a Blanket of Blue" (1939)

in the second measure of each A section (pointedly paired with the lyric "blue") and at the end of bridge. It also appears in the Sammy Fain standard "I'll Be Seeing You" (1938), m. 16.

Example 29 shows Coleman Hawkins' tenor saxophone solo and Ladders' accompaniment. The solo is in B-flat major, starting with a triplet of eighth notes (F4, G4, A4) and a half note (B4), followed by a quarter note (C5), a dotted quarter note (B4), and a half note (A4). The accompaniment shows three ladders: S (F4, G4, A4, B4), D° (F#4, G4, A4, B4), and T- (F4, G4, A4, B4). Chords Cm7b5, F7, and Bbm are indicated above the solo line.

Example 29. The diminished ladder in Coleman Hawkins's 1939 solo on "Body and Soul"

The half-diminished ladder, evidently devised by Charlie Parker, extends a half-diminished chord up from the dominant 7th. See Example 30. This example's accompaniment presents an eight-measure circle of dominant seventh chords, two measures apiece. The half-diminished ladder appears on D7, G7, and C7, arpeggiated clearly in each case. Assuring its dominant function, the ladder retains the functionally definitive tritone: for instance, in m. 2, against D7, the ladder includes C and F-sharp/G-flat. This passage's voice leading also stands out. Coming out of each half-diminished ladder, three or four voices descend by half-step. Parker uses at least two ladders against each chord. He interpolates relative subdominants before D7 and F7, a common bebop elaboration which turns a V into a II–V (Strunk 1979, 13–15). There is also a striking four-note passing ladder in m. 5.

Example 30 shows Charlie Parker's alto saxophone solo and Ladders' accompaniment. The solo is in B-flat major, starting with a triplet of eighth notes (F4, G4, A4) and a half note (B4), followed by a quarter note (C5), a dotted quarter note (B4), and a half note (A4). The accompaniment shows eight ladders: S/VI, Dø7/VII, D/II, Dø7/III, D/V, (D/V), (P), Dø7/V, S, Ddim, and D. Chords D7, G7, C7, and F7 are indicated above the solo line.

Example 30. The half-diminished ladder in a Charlie Parker solo on "Anthropology" (1952)

[illegible]

Though this device originated within the tonic ladder, and retained that use, b^7 came to express dominant function as well, with the descent from b^7 to 5 coinciding with harmonic motion from dominant to tonic. (Traces of this are even evident in Example 31: the appearance of b^7 corresponds to the accompaniment's II–V turnaround.) Examples 32–34 illustrate instances of this. In the melody in Example 32, mm. 2–3, the b^7 – 5 gesture coincides precisely with V–I resolution; yet b^7 continues into the next measure, over a tonic ladder, so it does not convincingly assimilate dominant function.

The image shows a musical score for two parts: 'Powell (RH)' and 'Ladders'. The 'Powell (RH)' part is written on a treble clef staff with a key signature of two flats (Bb and Eb). It begins with a time signature of [1:13]. The notes are: Bb4, Ab4, Gb4, Fb4, Eb4, D4, C4, Bb3, Ab3, Gb3, Fb3, Eb3, D3, C3, Bb2, Ab2, Gb2, Fb2, Eb2, D2, C2, Bb1, Ab1, Gb1, Fb1, Eb1, D1, C1, Bb0, Ab0, Gb0, Fb0, Eb0, D0, C0, Bb-1, Ab-1, Gb-1, Fb-1, Eb-1, D-1, C-1, Bb-2, Ab-2, Gb-2, Fb-2, Eb-2, D-2, C-2, Bb-3, Ab-3, Gb-3, Fb-3, Eb-3, D-3, C-3, Bb-4, Ab-4, Gb-4, Fb-4, Eb-4, D-4, C-4, Bb-5, Ab-5, Gb-5, Fb-5, Eb-5, D-5, C-5, Bb-6, Ab-6, Gb-6, Fb-6, Eb-6, D-6, C-6, Bb-7, Ab-7, Gb-7, Fb-7, Eb-7, D-7, C-7, Bb-8, Ab-8, Gb-8, Fb-8, Eb-8, D-8, C-8, Bb-9, Ab-9, Gb-9, Fb-9, Eb-9, D-9, C-9, Bb-10, Ab-10, Gb-10, Fb-10, Eb-10, D-10, C-10, Bb-11, Ab-11, Gb-11, Fb-11, Eb-11, D-11, C-11, Bb-12, Ab-12, Gb-12, Fb-12, Eb-12, D-12, C-12, Bb-13, Ab-13, Gb-13, Fb-13, Eb-13, D-13, C-13, Bb-14, Ab-14, Gb-14, Fb-14, Eb-14, D-14, C-14, Bb-15, Ab-15, Gb-15, Fb-15, Eb-15, D-15, C-15, Bb-16, Ab-16, Gb-16, Fb-16, Eb-16, D-16, C-16, Bb-17, Ab-17, Gb-17, Fb-17, Eb-17, D-17, C-17, Bb-18, Ab-18, Gb-18, Fb-18, Eb-18, D-18, C-18, Bb-19, Ab-19, Gb-19, Fb-19, Eb-19, D-19, C-19, Bb-20, Ab-20, Gb-20, Fb-20, Eb-20, D-20, C-20, Bb-21, Ab-21, Gb-21, Fb-21, Eb-21, D-21, C-21, Bb-22, Ab-22, Gb-22, Fb-22, Eb-22, D-22, C-22, Bb-23, Ab-23, Gb-23, Fb-23, Eb-23, D-23, C-23, Bb-24, Ab-24, Gb-24, Fb-24, Eb-24, D-24, C-24, Bb-25, Ab-25, Gb-25, Fb-25, Eb-25, D-25, C-25, Bb-26, Ab-26, Gb-26, Fb-26, Eb-26, D-26, C-26, Bb-27, Ab-27, Gb-27, Fb-27, Eb-27, D-27, C-27, Bb-28, Ab-28, Gb-28, Fb-28, Eb-28, D-28, C-28, Bb-29, Ab-29, Gb-29, Fb-29, Eb-29, D-29, C-29, Bb-30, Ab-30, Gb-30, Fb-30, Eb-30, D-30, C-30, Bb-31, Ab-31, Gb-31, Fb-31, Eb-31, D-31, C-31, Bb-32, Ab-32, Gb-32, Fb-32, Eb-32, D-32, C-32, Bb-33, Ab-33, Gb-33, Fb-33, Eb-33, D-33, C-33, Bb-34, Ab-34, Gb-34, Fb-34, Eb-34, D-34, C-34, Bb-35, Ab-35, Gb-35, Fb-35, Eb-35, D-35, C-35, Bb-36, Ab-36, Gb-36, Fb-36, Eb-36, D-36, C-36, Bb-37, Ab-37, Gb-37, Fb-37, Eb-37, D-37, C-37, Bb-38, Ab-38, Gb-38, Fb-38, Eb-38, D-38, C-38, Bb-39, Ab-39, Gb-39, Fb-39, Eb-39, D-39, C-39, Bb-40, Ab-40, Gb-40, Fb-40, Eb-40, D-40, C-40, Bb-41, Ab-41, Gb-41, Fb-41, Eb-41, D-41, C-41, Bb-42, Ab-42, Gb-42, Fb-42, Eb-42, D-42, C-42, Bb-43, Ab-43, Gb-43, Fb-43, Eb-43, D-43, C-43, Bb-44, Ab-44, Gb-44, Fb-44, Eb-44, D-44, C-44, Bb-45, Ab-45, Gb-45, Fb-45, Eb-45, D-45, C-45, Bb-46, Ab-46, Gb-46, Fb-46, Eb-46, D-46, C-46, Bb-47, Ab-47, Gb-47, Fb-47, Eb-47, D-47, C-47, Bb-48, Ab-48, Gb-48, Fb-48, Eb-48, D-48, C-48, Bb-49, Ab-49, Gb-49, Fb-49, Eb-49, D-49, C-49, Bb-50, Ab-50, Gb-50, Fb-50, Eb-50, D-50, C-50, Bb-51, Ab-51, Gb-51, Fb-51, Eb-51, D-51, C-51, Bb-52, Ab-52, Gb-52, Fb-52, Eb-52, D-52, C-52, Bb-53, Ab-53, Gb-53, Fb-53, Eb-53, D-53, C-53, Bb-54, Ab-54, Gb-54, Fb-54, Eb-54, D-54, C-54, Bb-55, Ab-55, Gb-55, Fb-55, Eb-55, D-55, C-55, Bb-56, Ab-56, Gb-56, Fb-56, Eb-56, D-56, C-56, Bb-57, Ab-57, Gb-57, Fb-57, Eb-57, D-57, C-57, Bb-58, Ab-58, Gb-58, Fb-58, Eb-58, D-58, C-58, Bb-59, Ab-59, Gb-59, Fb-59, Eb-59, D-59, C-59, Bb-60, Ab-60, Gb-60, Fb-60, Eb-60, D-60, C-60, Bb-61, Ab-61, Gb-61, Fb-61, Eb-61, D-61, C-61, Bb-62, Ab-62, Gb-62, Fb-62, Eb-62, D-62, C-62, Bb-63, Ab-63, Gb-63, Fb-63, Eb-63, D-63, C-63, Bb-64, Ab-64, Gb-64, Fb-64, Eb-64, D-64, C-64, Bb-65, Ab-65, Gb-65, Fb-65, Eb-65, D-65, C-65, Bb-66, Ab-66, Gb-66, Fb-66, Eb-66, D-66, C-66, Bb-67, Ab-67, Gb-67, Fb-67, Eb-67, D-67, C-67, Bb-68, Ab-68, Gb-68, Fb-68, Eb-68, D-68, C-68, Bb-69, Ab-69, Gb-69, Fb-69, Eb-69, D-69, C-69, Bb-70, Ab-70, Gb-70, Fb-70, Eb-70, D-70, C-70, Bb-71, Ab-71, Gb-71, Fb-71, Eb-71, D-71, C-71, Bb-72, Ab-72, Gb-72, Fb-72, Eb-72, D-72, C-72, Bb-73, Ab-73, Gb-73, Fb-73, Eb-73, D-73, C-73, Bb-74, Ab-74, Gb-74, Fb-74, Eb-74, D-74, C-74, Bb-75, Ab-75, Gb-75, Fb-75, Eb-75, D-75, C-75, Bb-76, Ab-76, Gb-76, Fb-76, Eb-76, D-76, C-76, Bb-77, Ab-77, Gb-77, Fb-77, Eb-77, D-77, C-77, Bb-78, Ab-78, Gb-78, Fb-78, Eb-78, D-78, C-78, Bb-79, Ab-79, Gb-79, Fb-79, Eb-79, D-79, C-79, Bb-80, Ab-80, Gb-80, Fb-80, Eb-80, D-80, C-80, Bb-81, Ab-81, Gb-81, Fb-81, Eb-81, D-81, C-81, Bb-82, Ab-82, Gb-82, Fb-82, Eb-82, D-82, C-82, Bb-83, Ab-83, Gb-83, Fb-83, Eb-83, D-83, C-83, Bb-84, Ab-84, Gb-84, Fb-84, Eb-84, D-84, C-84, Bb-85, Ab-85, Gb-85, Fb-85, Eb-85, D-85, C-85, Bb-86, Ab-86, Gb-86, Fb-86, Eb-86, D-86, C-86, Bb-87, Ab-87, Gb-87, Fb-87, Eb-87, D-87, C-87, Bb-88, Ab-88, Gb-88, Fb-88, Eb-88, D-88, C-88, Bb-89, Ab-89, Gb-89, Fb-89, Eb-89, D-89, C-89, Bb-90, Ab-90, Gb-90, Fb-90, Eb-90, D-90, C-90, Bb-91, Ab-91, Gb-91, Fb-91, Eb-91, D-91, C-91, Bb-92, Ab-92, Gb-92, Fb-92, Eb-92, D-92, C-92, Bb-93, Ab-93, Gb-93, Fb-93, Eb-93, D-93, C-93, Bb-94, Ab-94, Gb-94, Fb-94, Eb-94, D-94, C-94, Bb-95, Ab-95, Gb-95, Fb-95, Eb-95, D-95, C-95, Bb-96, Ab-96, Gb-96, Fb-96, Eb-96, D-96, C-96, Bb-97, Ab-97, Gb-97, Fb-97, Eb-97, D-97, C-97, Bb-98, Ab-98, Gb-98, Fb-98, Eb-98, D-98, C-98, Bb-99, Ab-99, Gb-99, Fb-99, Eb-99, D-99, C-99, Bb-100, Ab-100, Gb-100, Fb-100, Eb-100, D-100, C-100, Bb-101, Ab-101, Gb-101, Fb-101, Eb-101, D-101, C-101, Bb-102, Ab-102, Gb-102, Fb-102, Eb-102, D-102, C-102, Bb-103, Ab-103, Gb-103, Fb-103, Eb-103, D-103, C-103, Bb-104,

Example 32. Lowered ^7 coinciding with V-I resolution in a Bud Powell solo on "Strictly Confidential" (1949)

In Examples 33 and 34, ladder tones extending thirdwise below b^7 can only belong to dominant, clearly establishing b^7 's dominant function. In Example 33, where every note is contextually stable, the ladder extends down to the leading tone, C-natural, via the augmented ladder; the upward resolution of the dominant ladder is also remarkable. In Example 34, the dominant ladder extends down beyond the leading tone to the flat 9th, implying the half-diminished ladder. In both cases, additional ladder tones define b^7 as a dominant ladder's flat 10th. ("Sharp ninth" is this tone's more common but inaccurate label; cf. Larson 1998, 215.)

The musical score consists of two staves. The top staff, labeled 'Evans (RH)', is in treble clef and contains a melody with a time signature of [1:04]. Above the staff are three chord symbols: Ebm7, Ab7, and Db. The melody starts with a quarter rest, followed by an eighth-note triplet (Bb4, Ab4, Gb4), then a quarter note (Fb4), and ends with a quarter rest. The bottom staff, labeled 'Ladders', is in treble clef and contains three chords: S (Eb4, Ab4, Gb4), D+/b10 (Ab4, Gb4, Fb4), and T (Eb4, Ab4, Gb4). The chords are indicated by vertical lines and horizontal lines connecting the notes.

Example 33. The flat 10th tops the augmented ladder in a Bill Evans solo on "Solar" (1961)

Example 34. The flat 10th tops the half-diminished ladder in a Clifford Brown solo on "I'll Remember April" (1956)

Two further examples illustrate more allusive uses of the dominant flat 10th. In Example 35, Parker leaps directly from the dominant 3rd to the flat 10th, skipping over the tones that filled the gap in Examples 33–34. Leaving the flat 10th, he passes through the flat ninth on the way down to F; but given this passage's affinity with Examples 31–34, the flat ninth is best interpreted as an embellishing tone—part of a double-chromatic approach to F (a bebop *scène à faire*)—rather than a more consonant "resolution" of the flat 10th (contra Strunk 1985, 99). (In the same beat of the previous measure, Parker approaches A with the same double-chromatic approach.) Meanwhile, in Example 36, Bud Powell leaps to the flat 10th from the fifth below and then approaches C via the double-chromatic approach (cf. Example 37 below, m. 32). In both cases, the leap up to the flat 10th spans a multiple of thirds—in Example 35, an enharmonic seventh; in Example 36, a fifth)—which defines the flat 10th as part of the same ladder.

The image displays two staves of music in 4/4 time, key of B-flat major. The top staff, labeled 'Parker (alto sax)', shows a melodic line with notes and accidentals. Above the staff are labels: 'F7' above the first measure, 'P P' above the second, 'N N' above the third, 'F7' above the fourth, 'N N' above the fifth, and 'Bb' above the sixth. The bottom staff, labeled 'Ladders', shows a series of chords: 'D#11' in the first measure, 'Db10' in the second, and 'T' in the third. A curved line connects the 'D#11' and 'Db10' chords, indicating an enharmonic relationship. The 'F7' label above the fourth measure in the Parker staff corresponds to the 'Db10' chord in the Ladders staff.

Example 35. The flat 10th in a Charlie Parker solo on "Thriving on a Riff" (1945)

The image displays two staves of music in 4/4 time, key of B-flat major. The top staff, labeled 'Parker (alto sax)', shows a melodic line with notes and accidentals. Above the staff are labels: 'Gm7' above the first measure, 'C7' above the second, 'F' above the third, and 'N' above the fourth. The bottom staff, labeled 'Ladders', shows a series of chords: 'S' in the first measure, 'Db10' in the second, and 'T' in the third. A curved line connects the 'S' and 'Db10' chords, indicating an enharmonic relationship. The 'C7' label above the second measure in the Parker staff corresponds to the 'Db10' chord in the Ladders staff.

Example 36. The flat 10th in a Bud Powell solo on "Get Happy" (1950)

These chromatic adventures demonstrate the remarkable flowering of the tonal jazz language. Though varied and dramatic, the chromatic ladders build on a familiar principle: the structural coherence of ladders of thirds. Each ladder is constructed systematically in thirds from the dominant's root, third, or seventh, the harmony's functionally definitive tones. The resulting chromaticism reinvigorates the dominant-tonic progression and defines mid-century jazz.

* * *

We conclude with a longer example typical of the bebop style, which brings together all the techniques studied above. Example 37 shows the first chorus of a 1949 solo by Bud Powell (1924–1966) on "Wail," his own composition. The solo includes passages of stratified tonality and careful voice leading between ladders of thirds.

The musical score for Bud Powell's solo on "Wail" (1949) is presented in four systems. The top staff shows the piano solo (RH) in B-flat major, with measures numbered 1 through 33. The bottom staff shows the harmonic ladder, with notes and chords indicated by letters (T, S, D, etc.) and Roman numerals. The score includes various musical notations such as notes, rests, and accidentals. Above the solo staff, chord symbols are provided for each measure. Below the ladder staff, the functional relationship between the notes is indicated by letters (T, S, D, etc.) and Roman numerals. The score is numbered 1 through 33 measures.

Example 37. Bud Powell, solo on "Wail" (1949), first chorus

"Wail" is based on the thirty-two measure form usually called "Rhythm changes," a simplification of George Gershwin's "I Got Rhythm" (cf. Zbikowski 2002, 204–16). In the examples so far, when melody and accompaniment have been stratified, I have assumed that the accompaniment itself is a fixed entity. But this assumption is not valid for Rhythm changes. By 1949, this form had been subject to numerous harmonic variations, and musicians could mix these variations freely within a given performance. Certain moments are fairly rigid, implying an underlying deep structure—the tonic arrival in m. 15, for one. But other passages are far more flexible, especially in their details. The chord symbols above Powell's solo are an approximation of the form. (Practically speaking, the same flexibility also characterizes many other jazz tunes.)

Powell's melody follows roughly the same structure in mm. 1–8 and 9–16, varying in the details. Both sections reach a peak of D in their third measure. In their fifth to sixth measures, they tonicize A-flat by way of an inflected subdominant (B-flat half-diminished seventh) interpolated before the E-flat applied dominant. (Powell also uses interpolated subdominants in mm. 19, and 23–24. Interpolated subdominants are not melodic-harmonic stratification in the sense used above: "D" and "S–D" are interchangeable expressions of "dominant" (cf. Strunk 1979, 13–15).) In both sections, the final cadence involves stratified tonality, with Powell moving within the tonic ladder against the accompaniment's dominant in the seventh measure.

There is also stratified tonality in m. 10: Powell's G-flat suggests the inflected tonic ladder, superimposed over the accompaniment's II–V (cf. Examples 5–6 above). Finally, Powell reintroduces inflected tonic in mm. 27–28 against a series of accompanying harmonies. This reinterprets the form more dramatically: normally, m. 29 serves as a point of departure, the

beginning of the final four-measure phrase; instead, the G-natural in m. 29 resolves the tension of the protracted G-flat.

Typical of bebop, this solo also features intricate stepwise voice leading between succeeding ladders. In mm. 3–6, Powell implies two voices converging on E-flat and then two voices converging on A-flat. Measures 18–19 present a dissonant chromatic line from E-natural to D, beginning from a passing ladder. Over the C7 that follows, Powell extends this D into an interpolated subdominant, then slides F-natural up to F-sharp, transforming the subdominant into a dominant with sharp eleventh. (Both of these harmonies are secondary, tonicizing F.) Measures 30–33 are also a voice-leading marvel. Powell's top voice descends through a sixth, from G to B-flat; every note is supported by a ladder of thirds, and two lower voices make nearly complete descents of their own.

* * *

Tonal jazz melody draws on European tonality in many ways; but two of its definitive techniques derive instead from the ladders of thirds—structural, quasi-modal stacks of thirds—characteristic of early African-American music. First, in passages of stratified tonality, the melody moves within a tonic or subdominant ladder while the accompaniment presents a separate, conventionally tonal progression, most often the ubiquitous II–V–I. Within the melody, rhythm, phrasing, and contour, sometimes paired with chromatic inflection, project an independent, complementary syntax from the accompaniment. These passages are tense; resolution comes when the melody's arrival on $\hat{1}$ or natural $\hat{3}$ coincides with the accompaniment's return to I.

Second, even when jazz melody follows the accompaniment, a wide range of tones can project each harmony: ^3-2 can indicate dominant-tonic, for example (Example 16), or b^7-nat7 (Example 33). Jazz achieves this widening through a combination of highly predictable ("overdetermined") harmonic function and, once again, ladders of thirds: the extended tones always lie on a shared stack of thirds with more familiar chord tones, even in the case of bebop's extraordinary chromatic ladders. Ladders of thirds began as a quasi-modal technique for organizing an entire melody, and ended as a means of extending the variety of tones possible against a single, often momentary, harmony—often integrated within a long, stepwise line.

Both of these techniques can be explained solely as extensions of common-practice European tonality; but we arrive at a richer, and perhaps more accurate, understanding of jazz melody if we identify its origins in the African-American tradition as well.

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